

# SWBAT

experiment to determine  
what affects sliding

Sep 4-7:31 AM

## Welcome!!!

SECA CP Physics  
Wednesday 9 March 2016



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Room C-244

Centering  
(animals)

- Show me SchoolView if you want phone in class...
- VECTOR ADDITION due THURSDAY!!!

### Opening Activity - Quick Write:

Page 71 - Write a summary: What did we see about forces using the pillow and the board at different angles?

\$2?

I don't believe you have to be better than everybody else. I believe you have to be better than you ever thought you could be.

Ken Venturi

 <http://www.boredpanda.com/cute-baby-animals/>

11-15

Sep 7-7:04 AM

## What we should have solid:

Memorize our ~~5~~<sup>8</sup> vocab cards, units, vector or not, definition, formula

Be able to answer distance vs displacement questions

Be able to make measurements of real-life motion. Know what is likely to make timing things difficult and how to get more reliable timing results

Be able to convert between miles and meters, between hours, minutes, and seconds

Be able to calculate speed = dist/time and velocity = disp/time

Know what all of the symbols in the UAM equations stand for and mean

Be able to turn a UAM word problem into a list of knowns and unknowns

Be able to pick the equation with those 4 things in it

Be able to put the knowns into that equation

(Be able to solve for the unknown)

→ PROJECTILES:  $V_x$  IS CONSTANT;  $V_y$  CHANGES;  $a_y = -9.8 \text{ m/s}^2$  PG 42

PG 43 TIME,  $\Delta t$ , CONNECTS  $x$  &  $y$

PG 49 VECTORS INTO  $x$  &  $y$ , ADD VECTORS  
SOH - CAH - TOA

PG 59 DIFFERENCE BETWEEN MASS & WEIGHT

PG 61 NET FORCE

PG 63 FREE BODY DIAGRAMS

$$F = m \cdot a$$

QW every day to review - gather responses to front board.

Dec 4-9:15 AM

Unit	Chapters	Date
Left-Side Items	Page	Right-Side Items
REFLECTION ON NOTES	2	EDITED ADAM SAUGE
HOW FAR FROM BRIDGE	4	"FORT STUEBEN"
REFLECTION ON NOTES	6	HAWK: BASE UNITS
PR: DISTANCE & DISPLACEMENT	8	HAWK: FP DISPLACEMENT
DIAGRAM & STEPS	10	TIMING & ERROR
SUMMARY OF TIMING	12	HOW TO BUILD A TABLE
PR: CONVERTING SLOWS	14	HAWK: FP CONVERSIONS
PR: VELOCITY & SPEED	16	HAWK: FP SPEED & VELOCITY
SPEED WORD PROBLEMS	18	ALGEBRA FOR PHYSICS
LAB JOURNAL 10/7	20	LAB JOURNAL 10/8
...	...	HAWK: FP GRAPH POSITION
LAB JOURNAL 10/12	24	EXPERIMENT RUBRIC
26 USE FOR PROJECT	22	
OBSERVATIONS OF ORF	28	FP: INTRO TO ACC.
REVIEW FOR TEST	30	BALL ON RAMP
VECTORS, DIRECTION	32	FP: BASIC ACC EXAMPLE
PRACTICE UAM	34	FP: INTRO TO UAM
FALLING OBJECTS PACKET	36	FP: INTRO TO FREEFALL
MY FREE FALL WORD PROBLEM	38	3-ACT FALLING GLOWSTICK
Toy popper experiment	40	Free fall class solutions
Launched vs. Dropped	42	FP: INTRO TO PROJECTILE MOTION
PROJECTILE SIMULATOR	44	FP: PROJ. MOTION PROBLEM
PROJ. L PRACTICE PROBS.	46	PROJECTILES PRACTICE
OUR VECTOR PRACTICE	48	FP - VECTOR COMPONENTS
VECTOR PACKET	50	NOTES ON ADDING VECTORS
MEASURE LAUNCHER	52	NOTES ON FINDING $v_f$ & $S_2$
OBSERVATIONS OF OBJECTS	54	RULES OF PHYSICS NOTES
NEWTON'S 1 <sup>ST</sup> LAW	58	CONFUSING QUANTITIES
WKSHJ: 2-1	60	NET FORCE
PHET FORCES IN 1d	62	
PACKET: F.B.D.	62	FREE-BODY DIAGRAMS
DATA/MEASURING CART	64	FINDING FRICTION ON CART
MORE PROJECT?	66	MYTHBUSTERS
HAWK VECTOR ADDITION COMPONENTS	68	VECTOR EXAMPLE
		NORMAL VS. GRAVITY

Sep 5-9:09 AM

Pg 71

## Normal Force and Gravity...

Newton's 1st Law: OBJECTS TEND TO KEEP DOING WHAT THEY WERE DOING UNLESS ACTED UPON BY A FORCE

Dropped straight down:  $F_{\text{GRAV}} \downarrow$ 

Board at  $90^\circ$   $F_{\text{FRIC}} > 0$   
 LANDED RIGHT UNDER WHERE LET GO

Board at  $0^\circ$   $F_{\text{NORMAL}} \uparrow$   $F_{\text{GRAV}} \downarrow$  NO FRIC

Board at  $80^\circ$   $F_{\text{GRAV}} \downarrow$   $F_{\text{NORMAL}} \nearrow$   $F_{\text{FRIC}} \nwarrow$   
 THE BOARD PUSHED THE PILLOW SIDWAYS SOME...

Board at  $10^\circ$   $F_{\text{GRAV}} \downarrow$   $F_{\text{FRIC}} \rightarrow$   $F_{\text{NORMAL}} \nwarrow$

Board at  $45^\circ$   
 $F_{\text{gravity}} \downarrow$   $F_{\text{friction}} \nearrow$   $F_{\text{normal}} \nwarrow$

Application? CONSTRUCTION, MOVERS  
 FIRE FIGHTERS (LADDERS & ROPES), X GAME

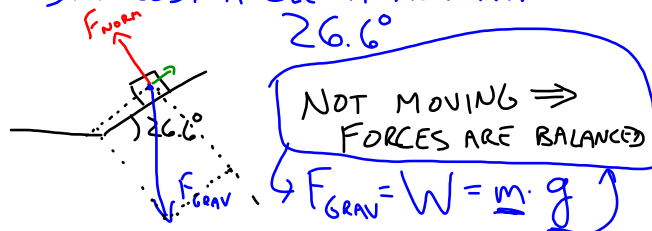
SUMMARY: GRAVITY ALWAYS POINTS STRAIGHT DOWN (CENTER OF EARTH).  
 NORMAL FORCE ALWAYS STRAIGHT OUT ( $\perp$ ) FROM THE BOARD.  
 FRICTION FORCE (AGAINST MOTION) ALWAYS UP ALONG THE BOARD.  
 NORMAL & FRICTION HAVE MORE OR LESS SIZE DEPENDING ON ANGLE OF BOARD.

Mar 7-7:53 AM

## PG 70 PHET RAMP!

TRIAL #1 CRATE  $m = 100\text{kg}$  ON EARTH  
 POSITION 4m  $g = 9.8\text{m/s}^2$   
 STARTING ANGLE  $10^\circ$

SMALLEST ANGLE IT MOVES....



NO FRICTION (ICE)  
 ANY ANGLE MAKES IT MOVE

MASS	ANGLE	GRAVITY ( $\text{m/s}^2$ )	ANGLE
200kg	$26.5\text{ to }6^\circ$	24.7	$26.6^\circ$
50kg	$26.6^\circ$	4	$26.6^\circ$
20kg	$26.6^\circ$	30	$26.6^\circ$

ANGLE

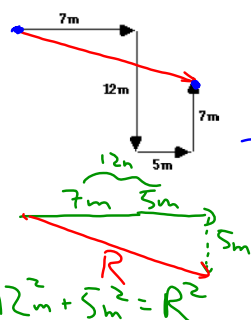
$$\mu_s = .3$$

$$\mu_s = .7$$

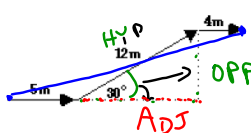
Mar 8-10:07 AM

PG 69

Vector examples:



x	y
+7m	+7m
+5m	-12m
12m	-5m



x	y
+5m	OPP = +6m
+4m	
ADJ = 10.49m	
+19.49m	+6m

CAH  
 $R \cos 30^\circ = \frac{ADJ}{HYP} \cdot 12m$

SOH  
 $12m (\sin 30^\circ) = \frac{OPP}{HYP} \cdot 12m$

$$\sqrt{R^2} = 19.49^2 + 6^2$$

$$= \sqrt{415.8m^2}$$

$$R = 20.4m$$



Mar 4-8:59 AM

Mar 7-10:11 AM